

## PATENT ABSTRACTS OF JAPAN

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### (54) ROTATION ANODE X-RAY TUBE AND TARGET THEREOF

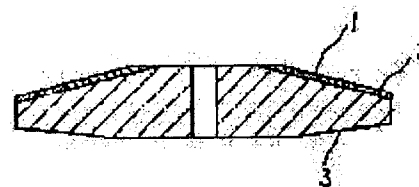
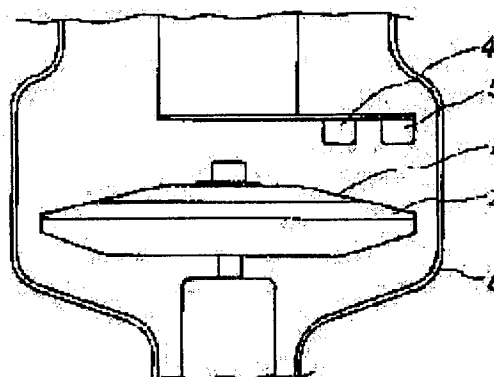
#### (57)Abstract:

PURPOSE: To generate X-ray having the desired ray quality without enlarging a device by providing multiple different ring-shape focus surfaces on a target basic material, and selecting the focus surface in response to the use of photographing.

CONSTITUTION: Two kinds of doughnut-shape focus surfaces 1, 2 are bonded on a target basic material 3. An anode provided with a target and a part for supporting multiple cathodes are sealed inside of a vacuum case 6.

Cathodes 4, 5 are provided opposite to the focus surfaces 1, 2. Electron beam from the cathodes 4, 5 collides with the focus surfaces 1, 2 to generate X-ray. At this stage, the X-ray having the ray quality corresponding to the material of the focus surfaces 1, 2 can be

generated. The X-ray having the desired ray quality can be obtained by providing a filter corresponding to each cathode and the material of the focus surfaces. furthermore, a shallow groove is provided in a part to be bonded, and since the focus surface 1 is fitted therein, contrast and image quality is improved without enlarging a device.



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the target for rotating anode X-ray tubes which is applied to the target for rotating anode X-ray tubes, especially can emit the X-ray of two or more kinds of quality of radiation.

[0002]

[Description of the Prior Art] When performing various kinds of roentgenography, there is a case where he wants to change the quality of radiation of the X-ray to emit. In order to generate conventionally the X-ray with which two or more kinds of quality of radiation differs from one X-ray tube, it was carried out by adding the filter of an ingredient which is different in the direction of X-ray emission of an X-ray tube as indicated by JP,41-17814,B.

[0003]

[Problem(s) to be Solved by the Invention] The above-mentioned conventional technique was not taken into consideration about the problem of the line type of the X-ray emitted from the problem and X-ray tube of withstand voltage at the time of attaching a filter. That is, when it approaches and a filter is attached near the front face of an X-ray tube, poor withstand voltage may arise, and if an insulation is strengthened, the problem which equipment enlarges will arise. Moreover, about the X-ray emitted, since the X-ray from which a filter is added and wavelength distribution differs according to the difference of an absorption coefficient will be obtained, there is a problem of decrease of that the line type of an X-ray is restricted and X dosage. The object of this invention is to cope with these troubles and offer the target for rotating anode X-ray tubes which can make stability generate the X-ray of the desired quality of radiation, without enlarging equipment.

[0004]

[Means for Solving the Problem] In order to attain the above-mentioned object, in a rotating anode X-ray tube target, the focal plane of the shape of a ring which consists of construction material from which plurality differs is established on a target base material. Furthermore, in a rotating anode X-ray tube, the above-mentioned target is provided, each of two or more focal planes of this target is countered, and cathode is prepared.

[0005]

[Function] By preparing the cathode which counters two or more focal planes and its each, the X-ray of the quality of radiation according to the construction material of a focal plane can be generated. At this time, the X-ray of the desired quality of radiation is obtained by preparing each cathode and the filter corresponding to focal plane construction material. Moreover, with the X-ray tube which applied this invention, although the number of cathode increases compared with the conventional X-ray tube, since such cathode is built in a bulb, the dimension of an X-ray tube becomes the same as the former. Moreover, equivalent dependability is acquired from structure being the same as that of the conventional X-ray tube.

[0006]

[Example] Hereafter, an attached drawing explains one example of this invention. Drawing 1 is the sectional view of the target of one example of this invention. Drawing 3 is the important section sectional view of the X-ray tube which used the target of this invention. As for the target of drawing 1, the focal plane, the focal plane A1, and focal plane B-2 of the shape of two kinds of doughnuts are joined on the target base material 3. Molybdenum and graphite are used as a target base material 3. A focal plane A1 and focal plane B-2 consist of a different metal, for example, a tungsten, and molybdenum. The junction to a focal plane and the target base material 3 is forging or brazing, when the target base material 3 is molybdenum, and when the target base material 3 is graphite, it is performed with a CVD method etc. Although the number of focal planes explained two kinds of cases above, it can be carried out similarly more than it.

[0007] In drawing 2, the part which supports the anode plate possessing a target and two or more cathode counters in the vacuum envelope 6, and sealing is carried out. As cathode, the focal plane A1 of a target and focal plane B-2 are countered, and cathode A4 and cathode B5 are prepared. The electron beam from cathode A4 collides with a focal plane A1, and generates an X-ray, and the electron beam from cathode B5 collides with focal plane B-2, and generates an X-ray. In this case, since construction material differs, a focal plane A1 and focal plane B-2 generate the X-ray of the quality of radiation different, respectively. When emitting an X-ray using the X-ray tube of this invention, a focal plane is selected according to a photography application, and high tension is impressed between the cathode and the targets which counter the focal plane. The X-ray of the quality of radiation which suited the application as a result is emitted. Moreover, it is desirable to prepare the filter which suited the construction material of a focal plane out of an X-ray tube.

[0008] Drawing 2 is the sectional view of other examples of this invention. What is necessary is to join only a focal plane A1, since the part corresponding to focal plane B-2 of drawing 1 can use the inclined plane of the target substrate 3 as it is when the target substrate 3 is used as molybdenum. In the target of this invention, a shallow slot is established in the part which joins a focal plane A1, a focal plane A1 is fitted in into it, and it joins by forging or brazing.

[0009]

[Effect of the Invention] According to this invention, since the selection activity of the X-ray of a suitable line type can be carried out according to a photographic subject with one X-ray tube, the improvement in image quality by improvement in contrast, prevention of a fogging, etc. is attained. Moreover, since one equipment can attain the function of two or more equipments, reduction of cost can also be performed.

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[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] The target for rotating anode X-ray tubes characterized by establishing the focal plane of the shape of a ring which consists of construction material from which plurality differs on a target base material.

[Claim 2] The rotating anode X-ray tube characterized by having provided the target of claim 1, having countered each of two or more focal planes of this target, and preparing cathode.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the sectional view of the target of one example of this invention.

[Drawing 2] It is the sectional view of the target of other examples of this invention.

[Drawing 3] It is the important section sectional view of the X-ray tube using the target of this invention.

[Description of Notations]

- 1 Focal Plane A
- 2 Focal Plane B
- 3 Target Base Material
- 4 Cathode A
- 5 Cathode B

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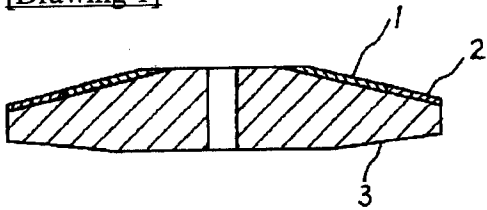
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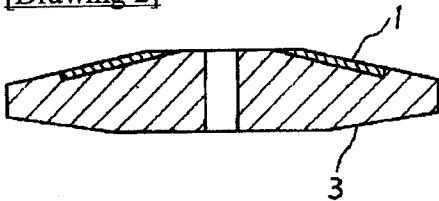
DRAWINGS

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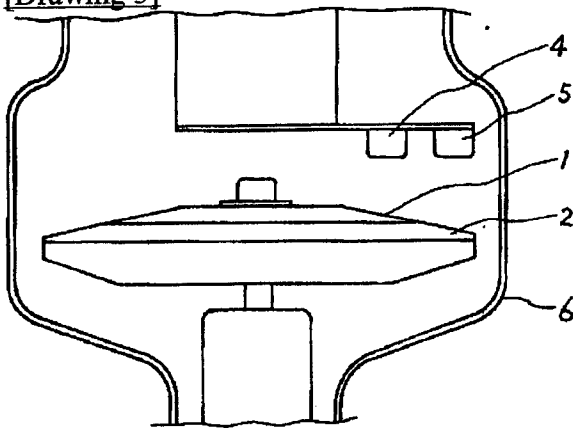
[Drawing 1]



[Drawing 2]



[Drawing 3]



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[Translation done.]